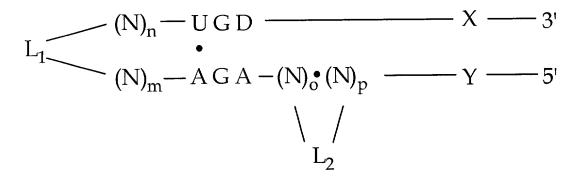
## Claims

What is claimed is:

1. A nucleic acid molecule with endonuclease activity having the formula I:



wherein, each N represents independently a nucleotide or a non-nucleotide linker, which may be same or different; X and Y are independently oligonucleotides of length sufficient to stably interact with a target nucleic acid molecule; m, n, o, and p are integers independently greater than or equal to 1, wherein if  $(N)_m$  and  $(N)_n$  and/or  $(N)_0$  and  $(N)_p$  are nucleotides,  $(N)_m$  and  $(N)_n$  and/or  $(N)_0$  and  $(N)_p$  are optionally able to interact by hydrogen bond interaction; D is U, G or A;  $L_1$  and  $L_2$  are independently linkers, which may be the same or different and which may be present or absent, but when present, are nucleotide and/or a non-nucleotide linkers which may be a single-stranded and/or double-stranded region.

2. A nucleic acid molecule with endonuclease activity having the formula II:

$$3' - X - Z - Y - 5'$$

- wherein, N represents a nucleotide or a non-nucleotide linker; X and Y are independently oligonucleotides of length sufficient to stably interact with a target nucleic acid molecule; Z is an oligonucleotide having a nucleotide sequence selected from the group consisting of 5'-AGAUAACGUGAAGAU-3' (SEQ ID NO 53) and 5'-AAUGGCCUAUCGGUGCGA-3' (SEQ ID NO 54).
- 3. The nucleic acid molecule of claim 1, wherein said (N)<sub>m</sub> is selected from the group consisting of 5'-AC-3', 5'-GC-3', and 5'-CG-3' and (N)<sub>n</sub> is selected from the group consisting of 5'-GU-3', 5'-GC-3', and 5'-CG-3'.

- 4. The nucleic acid molecule of claim 1, wherein said (N)<sub>0</sub> is selected from the group consisting of 5'-AUUG-3', 5'-UUC-3', and 5'-UAG-3' and (N)<sub>p</sub> is selected from the group consisting of 5'-CAAU-3', 5'-CAA-3', 5'-GAA-3', and 5'-CUA-3'.
- 5. The nucleic acid molecule of claim 1, wherein  $L_1$  is a nucleotide linker.
- 5 6. The nucleic acid molecule of claim 1, wherein  $L_2$  is a nucleotide linker.
  - 7. The nucleic acid molecule of claim 5, wherein said nucleotide linker is a sequence consisting of 5'-CUUAA-3' or 5'-CUAAA-3'.
  - 8. The nucleic acid molecule of claim 6, wherein said nucleotide linker is a sequence consisting of 5'-UGUGAA-3' or 5'-GUGA-3'.
  - 9. The nucleic acid molecule of claim 5 or claim 6, wherein said nucleotide linker is a nucleic acid aptamer.
  - 10. The nucleic acid molecule of claim 9, wherein said aptamer is an ATP aptamer.
  - 11. The nucleic acid molecule of claim 1, wherein  $L_1$ ,  $L_2$ , or  $L_1$  and  $L_2$  is a non-nucleotide linker.
  - 12. The nucleic acid molecule of claim 1 or claim 2, wherein said chemical linkage is independently or in combination selected from the group consisting of phosphate ester, amide, phosphorothioate, phosphorodithioate, arabino, and arabinofluoro linkages.
  - 13. The nucleic acid molecule of claim 1 or claim 2, wherein said nucleic acid molecule is chemically synthesized.
- 14. The nucleic acid molecule of claim 1 or claim 2, wherein said nucleic acid molecule comprises at least one sugar modification.
  - 15. The nucleic acid molecule of claim 1 or claim 2, wherein said nucleic acid molecule comprises at least one nucleic acid base modification.
  - 16. The nucleic acid molecule of claim 1 or claim 2, wherein said nucleic acid molecule comprises at least one phosphate backbone modification.
- 25 17. The nucleic acid molecule of claim 14, wherein said sugar modification is selected from the group consisting of 2'-H, 2'-O-methyl, 2'-O-allyl, 2'-C-allyl, 2'-deoxy-2'-fluoro, and 2'-deoxy-2'-amino modifications.

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- 18. The nucleic acid molecule of claim 16, wherein said phosphate backbone modification is selected from the group consisting of phosphorothioate, phosphorodithioate, and amide modifications.
- 19. The nucleic acid molecule of claim 1 or claim 2, wherein said nucleic acid molecule comprises a 5'-cap, a 3'-cap, or both a 5'-cap and a 3'-cap.
- 20. The nucleic acid molecule of claim 19, wherein said 5'-cap is a phosphorothioate modification of at least one 5'-terminal nucleotide in said nucleic acid molecule.
- 21. The nucleic acid molecule of claim 19, wherein said 5'-cap is a phosphorothioate modification of at least two 5'-terminal nucleotides in said nucleic acid molecule.
- 10 22. The nucleic acid molecule of claim 19, wherein said 5'-cap is a phosphorothioate modification of at least three 5'-terminal nucleotides in said nucleic acid molecule.
  - 23. The nucleic acid molecule of claim 19, wherein said 5'-cap is a phosphorothioate modification of at least four 5'-terminal nucleotides in said nucleic acid molecule.
  - 24. The nucleic acid molecule of claim 19, wherein said 3'-cap is a 3'-3' inverted riboabasic moiety.
  - 25. The nucleic acid molecule of claim 19, wherein said 3'-cap is a 3'-3' inverted deoxyriboabasic moiety.
  - 26. The nucleic acid molecule of claim 1 or claim 2, wherein said nucleic acid cleaves a separate nucleic acid molecule.
- 27. The nucleic acid molecule of claim 26, wherein said separate nucleic acid molecule is RNA.
  - 28. The nucleic acid molecule of claim 26, wherein said nucleic acid comprises between 12 and 100 bases complementary to said separate nucleic acid molecule.
  - 29. The nucleic acid molecule of claim 26, wherein said nucleic acid comprises between 14 and 24 bases complementary to said separate nucleic acid molecule.
- 30. The nucleic acid molecule of any of claims 1 and 2, wherein said X and Y are independently of length selected from the group consisting of 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, and 20 nucleotides.

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- 31. The nucleic acid molecule of claim 1 or claim 2, wherein the length of X is equal to the length of Y.
- 32. The nucleic acid molecule of claim 1 or claim 2, wherein the length of X is not equal to the length of Y.
- 5 33. A cell including the nucleic acid molecule of claim 1 or claim 2.
  - 34. The cell of claim 33, wherein said cell is a mammalian cell.
  - 35. The cell of claim 34, wherein said cell is a human cell.
  - 36. An expression vector comprising a nucleic acid sequence encoding at least one of the nucleic acid molecules of claim 1 or claim 2, in a manner which allows expression of the nucleic acid molecule.
  - 37. A cell including the expression vector of claim 36.
  - 38. The cell of claim 37, wherein said cell is a mammalian cell.
  - 39. The cell of claim 38, wherein said cell is a human cell.
  - 40. A pharmaceutical composition comprising the nucleic acid molecule of claim 1 or claim 2.
  - 41. A method for modulating expression of a gene in a plant cell by administering to said cell the nucleic acid molecule of claim 1 or claim 2.
  - 42. A method for modulating expression of gene in a mammalian cell by administering to said cell the nucleic acid molecule of claim 1 or claim 2.
- 43. A method of cleaving a separate nucleic acid comprising, contacting the nucleic acid molecule of claim 1 or claim 2 with said separate nucleic acid molecule under conditions suitable for the cleavage of said separate nucleic acid molecule.
  - 44. The method of claim 43, wherein said cleavage is carried out in the presence of a divalent cation.
  - 45. The method of claim 44, wherein said divalent cation is  $Mg^{2+}$ .
- 25 46. The expression vector of claim 36, wherein said vector comprises:

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- a) a transcription initiation region;
- b) a transcription termination region;
- c) a nucleic acid sequence encoding at least one nucleic acid molecule of claim 1 or claim 2; and
- wherein said nucleic acid sequence is operably linked to said initiation region and said termination region, in a manner which allows expression and/or delivery of said nucleic acid molecule.
  - 47. The expression vector of claim 36, wherein said vector comprises:
    - a) a transcription initiation region;
    - b) a transcription termination region;
    - c) an open reading frame;
    - d) a nucleic acid sequence encoding at least one nucleic acid molecule of claim 1 or claim 2, wherein said sequence is operably linked to the 3'-end of said open reading frame; and

wherein said nucleic acid sequence is operably linked to said initiation region, said open reading frame and said termination region, in a manner which allows expression and/or delivery of said nucleic acid molecule.

- 48. The expression vector of claim 36, wherein said vector comprises:
  - a) a transcription initiation region;
  - b) a transcription termination region;
  - c) an intron;
  - d) a nucleic acid sequence encoding at least one nucleic acid molecule of claim 1 or claim 2; and
  - wherein said nucleic acid sequence is operably linked to said initiation region, said intron and said termination region, in a manner which allows expression and/or delivery of said nucleic acid molecule.

- 49. The expression vector of claim 36, wherein said vector comprises:
  - a) a transcription initiation region;
  - b) a transcription termination region;
  - c) an intron;
- 5 d) an open reading frame;
  - e) a nucleic acid sequence encoding at least one nucleic acid molecule of claim 1 or claim 2, wherein said sequence is operably linked to the 3'-end of said open reading frame; and

wherein said nucleic acid sequence is operably linked to said initiation region, said intron, said open reading frame and said termination region, in a manner which allows expression and/or delivery of said nucleic acid molecule.